

# REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA



## Bicycle and Pedestrian Plan

*October 2008*

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# 1 Introduction

## 1.1 Background: Definition of Terms and History of Non-motorized Planning Activities at the RTC

### 1.1.1 Bicycle and Pedestrian Element and Its Role within the RTP

Under federal planning requirements defined by the Federal Highway Administration (FHWA) located in the Federal Register and defined in 23 CFR, Part 450, 'all metropolitan planning organizations must include a thorough identification of existing and planned facilities for all pedestrian walkways and bicycle transportation facilities within the body of the regional transportation plan' - Plan. Readers interested in the reviewing the federal guidance can go to the FHWA's website at <http://www.fhwa.dot.gov>. In practice, this section of the Plan is defined as the Bicycle and Pedestrian Element. The term Element refers to the different subject areas of analysis required by the FHWA for inclusion in an approvable RTP.

Other than the federal requirement, one of the key reasons for establishing a BPE is that MPOs must find ways to maximize the transportation network and investments as part of the mandate to promote and provide regional mobility, defined as the efficient movement of both persons and goods. However development of a regional plan and strategies to achieve efficient regional mobility has not been a simple task, because many social factors and national trends have conspired to create barriers to non-motorized travel.

In the not so distant past, a majority of the transportation planning efforts planning focused on improving conditions for the rapid movement of vehicles along roadways. This narrow focus on motorized mobility resulted in several unintended consequences. First, it fostered planning and design scenarios that segregated land uses, creating longer trips and making it necessary to travel by vehicle for the majority of trips across the U.S. Second, due to the auto-dominated mindset, many agencies minimized or even excluded adequate accommodation for non-motorized travel.

The legacy is that many streets are uncomfortable to walk or bike on which ultimately serves as a deterrent to the use of roadways for anything other than auto travel. In 1977 for example, 9.3 percent of all trips in the U.S. were made by walking, however by 1995 this number had declined to only 5.5 percent of all trips (Source: *National Personal Transportation Survey* 1995). The BPE and its required comprehensive approach defines the RTC's strategies, policies and programs developed to stem the tide of this trend. The remainder of this document will provide detailed information about how this agency is working to encourage and support non-motorized forms of travel through the various plans for adequate, interconnected and safe facilities that accommodate all modes of transportation.

### **1.1.2 Impetus for Focus on Alternative Mode Travel - Federal Shift in Transportation Focus Areas**

In 1991 the Federal Highway Bill, the Intermodal Surface Transportation Efficiency Act (ISTEA), changed how urbanized areas must plan for transportation by directing MPOs to focus on improvements in regional mobility for all modes of transportation. For the first time in history the federal government formally recognized the need for MPOs to consider cycling and walking as legitimate forms of transportation. This was done by “requiring states and metropolitan areas to plan for the development and integrated management and operation of transportation systems and facilities and to specifically include consideration of pedestrian walkways and bicycle transportation facilities.”

Following ISTEA, the 1998 Federal Highway Bill, the Transportation Efficiency Act for the 21st Century (TEA-21), continued to elevate bicycling and walking to the same status of consideration as motorized travel. TEA-21 stated that: “Bicycle transportation facilities and pedestrian walkways shall be considered, where appropriate, in conjunction with all new construction and reconstruction and transportation facilities, except where bicycle and pedestrian use are not permitted” - (Section 1202(a) of TEA 21).

The current Federal Highway Bill, SAFETEA-LU reiterates the required consideration of planning, evaluation and maintenance of non-motorized travel with metropolitan areas.

### **1.1.3 History of Non-motorized Planning Activities and Accomplishments by the RTC**

The purpose of this section is to familiarize the reader with the RTC’s history of the events, activities and planning actions/approvals to accommodate and improve non-motorized forms of travel. The section is organized chronologically from 1995, a milestone in RTC’s non-motorized planning. Throughout this document the term “alternative modes” will be used interchangeably to mean non-motorized travel, either cycling or walking.

#### **1995 Revision to Regional Street Standards: Creating Compatible Streets for Cycling**

In 1995 the RTC adopted a revision to the its Streets Standards that required all roadways funded by the RTC to include a minimum 14-foot-wide curb lane. The measurement does not include the width of the gutter pan. The 14-foot curb lane is the American Association of State Highway Transportation Officials (AASHTO) recommended lane width for shared bicycle and motorized vehicle travel.

Since adoption, the RTC has approved only two waivers of this standard. Today about 95 percent of the built street network in the Las Vegas Valley is bicycle travel compatible. The 5 percent that is not compatible includes streets that were constructed prior to the standard and may only have enough right-of-way for two 12-foot travel lanes.

## 1996 Bicycle Master Plan Adoption and Regional Bikeway Map

**Figure 1-1: 1996 Share the Road Sign**



In 1996, the RTC adopted the Bicycle Master Plan, which consisted of 440 centerline miles of bicycle routes and 60 centerline miles of bicycle lanes. The Plan was dominated by bike routes and relied on the existence of wide curb lanes as part of the implementation process. The RTC had not yet identified a dedicated funding mechanism for the bikeway facilities, nor was there any ancillary signage provided to denote specific facilities. An effort was made to identify any constraints along segments of roadways. The Master Plan was represented on the RTC's first bicycle map, which was produced in the same year.

The first regional bike facility map produced by the RTC to assist the public/users in facility identification and routing, displayed as Figure 1-2, is dominated by bike routes and uses what was then an experimental - Share the Road sign. The map also provided location information on public facilities, shopping, recreation and schools.

Conveying information to both cyclists and motorists on expected shared travel behavior is something that the RTC believed an essential prerequisite to creating a more cycling friendly community. In 1996, the RTC applied to the FHWA for a permit to experiment with non-standard signage. The agency's concept included an iconic cyclist and a passenger car on a travel facility with a supplement placard using the American Wheelman Federation phrase "Share the Road". FHWA granted permission to use the signs and the RTC installed about 1,200 signs throughout the Las Vegas Valley on the adopted bicycle routes meeting the shared use travel facilities standard that includes a 14-foot curb lane. Figure 1-1 shows an example of such a sign.

Following the sign implementation, a survey found that over 68 percent of respondents indicated that the sign did have the effect of 'creating an awareness' of cyclists. Participants also indicated that they were more likely to yield to cyclists as a result of the sign's presence.

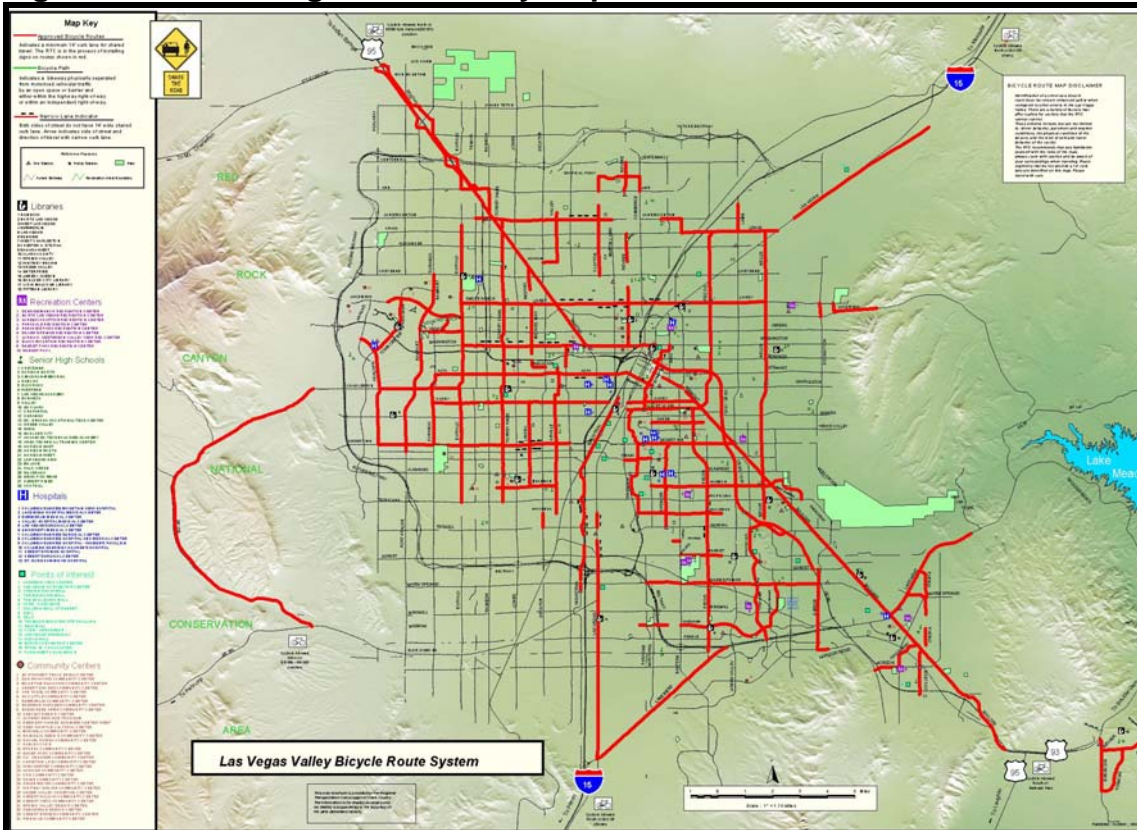
The RTC conducted a field recorded video survey comparing the entry of cyclists into a stream of traffic on those streets with Share the Road signs and on streets without the signs. Over 250 observation rides were made. The results showed that motorist tended to yield both sooner and with a greater degree of space between the vehicle and the auto on routes where the signs were present.

In 2002, the federal government adopted the "Share the Road" placard as part of the Manual on Uniform Traffic Devices (MUTCD). Additionally, multiple local and state



entities across the United States have applied the new sign on bikeways. The sign/placard is now standard for bicycle routes in the Las Vegas Valley and is located approximately every 500 feet (10 per mile) on implemented bicycle routes.

**Figure 1-2: 1996 Regional Bikeway Map**



## 1998 Bikes on Buses



In 1998, the RTC installed bike carriers on all of the CAT buses. Since inception, there has been a steady increase in usage. This program has been beneficial because it directly improved travel accessibility across the Las Vegas Valley and made it feasible to travel longer distances via bike by combining the two modes of travel. More information on usage is provided under Existing Conditions later in this document.

## 1998 - SNPLMA funds

The Southern Nevada Public Lands Management Act (SNPLMA) of 1998 allows the Bureau of Land Management (BLM) to sell public land within the disposal boundary that surrounds the Las Vegas Valley. Most of the revenue derived from the land sales can be used to fund:

- Parks, trails, and natural areas;
- Capital improvements;
- Conservation initiatives;
- Environmentally sensitive land acquisitions; and
- Lake Tahoe Restoration projects

For additional information on projects that have been submitted and approved, as well as a listing of current applications, please refer to the BLM website, <http://www.nv.blm.gov>. While the RTC does not control these funds, the agency and member entities can apply to fund any eligible activity. For the purposes of this discussion, much of this funding has been used to construct segments defined within the adopted off-street system called the Shared Use Trail network . The first set of projects was funded in Round 2 from the application process in 2000.

### **2001-2003 Alternative Mode Master Plan**

In 2001, the RTC undertook the Alternative Mode Master Plan Study to evaluate non-motorized travel needs within the Las Vegas metropolitan area for a least a 20-year period. The Study, completed in early 2003, provided the backdrop for the current non-motorized network plan for on- and off-street (Shared Use Trails) bikeways and pedestrian networks. The study is available on the RTC website, <http://www.RTCSouthernNevada.com>.

It is important to note that all of the recommendations that emanated from this study were a result of a coordinated and cooperative process that involved the RTC's member entities, including Clark County and the Cities of Las Vegas, North Las Vegas, Henderson and Boulder City, and the Nevada Department of Transportation, the Nevada Office of Traffic Safety, and the Safe Kids/Safe Communities Partnership. In addition, the working group included representation from the Bureau of Land Management, the U.S. Forest Service, the U.S. Park Services, bicycling advocates and the Southern Nevada Home Builders Association. The Study's findings were brought to the general public during a publicized open public comment period and at two public hearings.

The working group established a series of goals and objectives designed to:

- Identify facility alignments adequate to accommodate anticipated development for a 20-year cycle, identify unit/segment costs for engineering and construction,
- Assure coordination between roadway development and alternative mode implementation,
- Define procedures for facility selection, removal and modification and
- Create a process for the continued coordination and the sharing of information regarding local/regional connectivity for non-motorized travel.

### Long-term facility alignments and identification of facility type

On-street – After considerable review of safety data and national trends, the working group determined that, where the capacity was available for implementation, bike lanes provided the best cycling facility. In fact, the study reversed the previous trend by the



RTC, which had adopted three times as many lane miles of bike routes as bike lanes, and recommended 735 centerline miles of bike lanes and 395 centerline line miles of bike routes. Additionally, the facility map identified alignments for undeveloped areas assuming the continuation of existing roadway patterns.

Off-street – A consultant team physically mapped all of the shared use path opportunities, which included undeveloped areas, flood control maintenance paths, utility corridors and BLM land. Ultimately, the Study recommended 634 miles of Shared Use Paths for the network. The study also defined the minimum acceptable path width as 12-foot width and 2-foot shoulders.

#### Facility Costs by Length/by Unit

The Study provided a detailed cost analysis for lanes, routes and paths and established a region wide-cost for the full implementation. This information provided the data about cost which served as key input for the RTC's 2002 Question 10 Initiative, discussed in more detail later under Existing Conditions.

#### Facility Selection/Modification and Elimination Policies

The working group developed a consensus that, due to the slower posted speeds, the generally fewer driveways and the primary absence of truck travel, bike facilities should be located on minor arterial and collectors. It was agreed that modifications to facilities would “flow through” the RTC's advisory committee process and that all changes would require an amendment to the RTP. An adopted bike segment could be eliminated only in the case of a hazard that could not be mitigated through policy or geometric revision.

#### Revised Regional Non-Motorized Goals and Objectives

The Vision and Goals still in use today were developed by this working group.

#### Areas for Regional Enhancement/Future Studies

The following areas were identified by the working group as areas for future attention by the RTC:

- Improved tracking of crash rates;
- Creation of a public awareness and safety campaign devoted to rules of the road for cyclists and pedestrians;
- Safe traveling behavior, including bike equipment, clothing, hydration, anti-jaywalking concepts;
- Facility retrofit concepts, including ways to improve the walking and cycling experience on streets that have continuous left turn lanes and lacked landscaping and landscaping buffers;
- End-of-trip facilities, including access, safety, security, showers, and lockers; and
- Develop methods to improve walking access within neighborhoods including possible retrofit openings at residential block walls and better circulation.

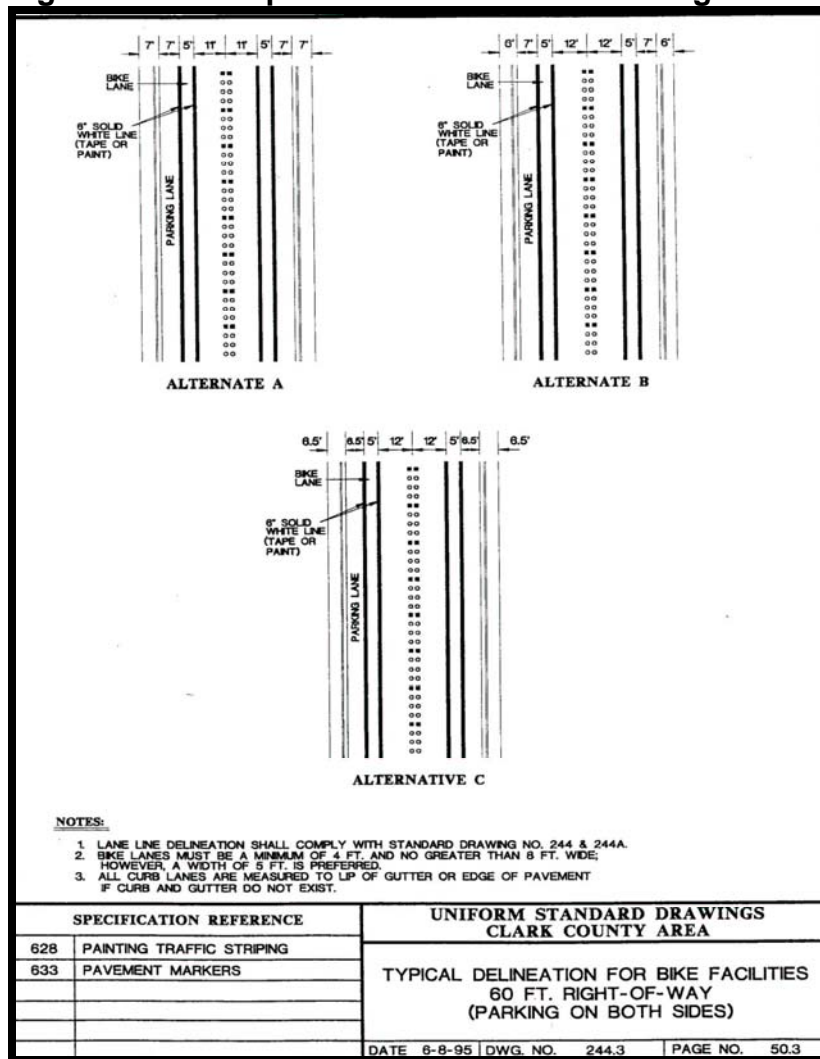
#### **2002 Alternate Street Standards**

As a result of the Alternative Mode Study, the RTC convened a working group to consider changes to the Regional Street Standards to improve the walking and cycling

experience and accommodation. The group included emergency response agencies, the Public Works, Planning and Zoning departments from the member entities, the Southern Nevada Home Builders Association and several members from the general public.

After six months of meetings, a consensus was reached regarding the revision to the street standards. In general, the new standards widened the overall right-of-way on 80-foot streets to 90 feet, 100-foot streets to 110 feet, and 114-foot to 124 feet. The key change in all of the scenarios was to widen the sidewalk from 4 to 8 feet and to create a 2-foot “dry utility” corridor between the curb edge and the walking space as a buffer between auto and foot travel. Additionally, as was the preference for facility type, the working group recommended that the cycling facility be a bike lane, further increasing the buffer between auto and foot travel. See Figure 1-3 below.

**Figure 1-3: Examples of Alternate Street Designs**



The standard cannot be applied as a retro-fit, however where new facilities are being developed and built, the new standard can be applied as long as the corridor is at least one-half of a mile in length. See the RTC's website; <http://www.RTCSNV.com>, for a complete set of standard drawings.

## **1.2 Structure of the Bicycle and Pedestrian Plan Element (BPE)**

The Regional Transportation Commission of Southern Nevada (RTC) serves as the Metropolitan Planning Organization (MPO) for all of Clark County. Under the existing federal transportation funding bill, Safe Accountable Flexible Efficient Transportation Efficiency Act – A Legacy for Users (SAFETEA-LU), MPOs are required to specifically address walking and cycling in the Regional Transportation Plan. Each MPO has the latitude to determine how the agency's BPE will be structured as long as it adequately responds to FHWA Planning Guidance by including the following topics:

- Vision and Goal Statements with Performance Criteria
- Assessment of Current Conditions
- Identification of Activities Required to Meet the Vision and Goals
- Evaluation of Progress
- Public Involvement
- Implementation of the Bicycle and Pedestrian Elements in the MPO Transportation Plans and Transportation Improvement Programs

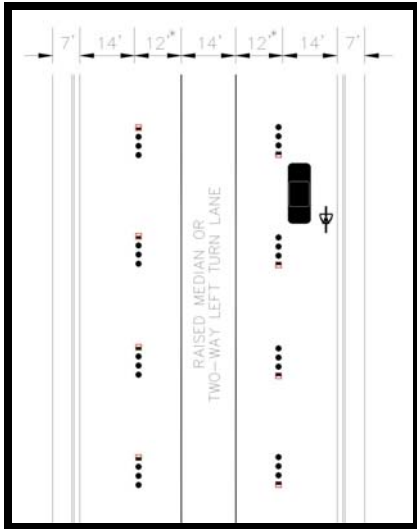
RTC's Adopted Structure for the 2009 -2030 BPE reflects these requirements as follows:

1. Introduction: Framing the Alternative Mode Issues
2. Background: Definition of Terms and History of Non-motorized Planning Activities at the RTC
3. Vision and Goals
4. Review of Existing Conditions
5. Progress of RTC's Adopted Goals
6. Identification of Strategies to Meet the Vision and Goals
7. Public Involvement
8. Future Alternative Mode Planning/Policy Initiatives

## **1.3 Framing the Alternative Mode Issues**

Over the past 50 years there has been a shift in residential develop away from the city to suburban areas in many parts of the U.S. This change in land use patterns came with a greater reliance on the automobile for almost all trips. In fact, the 2001 National Household Transportation Survey indicates that 87 percent of all trips are made by vehicle, compared to 8.6 percent mode share for walking and 1.5 percent mode share for cycling. The reliance on the automobile for most trips has dramatically increased the numbers of daily miles traveled by Americans each year beginning in the early 1970's. The result is that our freeways and arterial roadways are more congested than ever

**Figure 1-4: Bicycle Route Detail**



and, in many places, cities have run out of options for roadway expansion to accommodate the daily vehicular demand.

While modest travel congestion has existed for some time in Southern Nevada, the doubling of population from 797,000 to 1,429,000 in the 1990's rapidly exacerbated the problem. By 2008, the Las Vegas Valley reached 2,000,000 residents. As a result, on average 100 additional cars are added to the roadway network per day, quickly adding to the daily miles of travel and worsening congestion. In 2000 residents traveled approximately 24,000,000 vehicle miles per day on the Las Vegas Valley roadway network. By 2008 that number almost doubled to 45,000,000 daily miles of travel and is projected to reach at least 74,000,000 miles per day by 2030.

The RTC's core mobility strategy is to provide a balanced approach within the Plan by focusing on the transportation fundamental: mobility. Mobility is defined as the efficient movement of people and goods across a region. The emphasis on mobility seeks to improve all modes of travel, including the transit system and facilities permitting a greater reliance on walking and biking.

Keys to the success of shifting modes away from the automobile include 1) increasing the participation of alternative mode travel through various means of encouragement and 2) assuring that adequate infrastructure exists to accommodate more walking and cycling trips. The following section is presented as a way to frame the issues by providing the reader with essential information on a) definitions of alternative mode facilities, b) the significance of walking and biking and, c) the factors that can encourage greater participation in alternative mode travel. Later in the document, under 'Existing Conditions', the walking and biking infrastructure is discussed, including previously adopted plans for the future facilities and connections.

## **1.4 The Basics – Defining Alternative Mode Facilities**

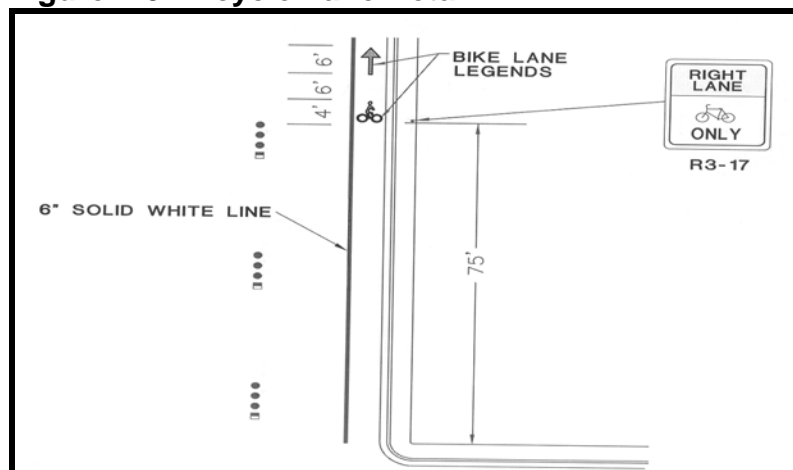
### **1.4.1 Introduction to BPE Terms**

The following facility definitions are provided to enhance the reader's understanding of the different types of facilities for cycling and walking discussed throughout this document. The BPE recognizes the following FHWA definitions for a bicycle route, a bicycle lane and a shared use path.

**Signed Shared Roadway (Signed Bike Route)** – A shared roadway that has been designated by signing as a preferred route for bicycle use. Bicycle routes are designated on roadways that have a wide curb lane of at least 14 feet or greater

between the lane line and the lip of the curb. The 14-foot measure does not include the width of the 1.5-foot-wide gutter pan. The RTC has adopted the Share the Road figure and the supplemental placard with the words – Share the Road. Figure 1-4 shows this in detail.

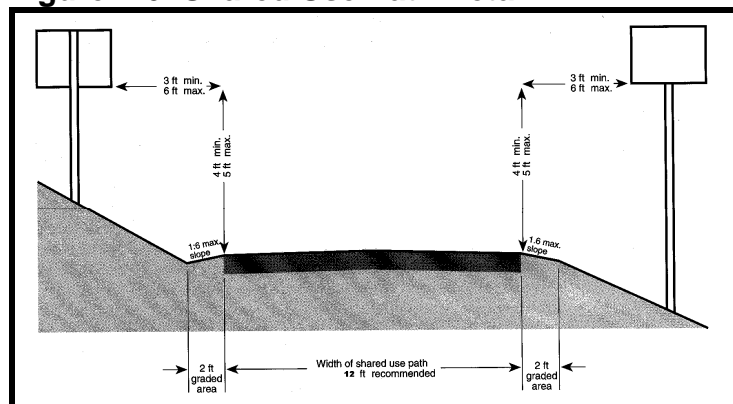
**Figure 1-5: Bicycle Lane Detail**



**Bicycle Lane** – A portion of a roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists. For bicycle lanes, the minimum width of the bicycle lane shown below is set in the actual standard as 4-foot minimum from the bicycle lane stripe to the edge of pavement, plus a 1.5-foot-wide gutter pan. A

maximum ¼-inch lip is specified for the vertical distance between the pavement and gutter pan. Figure 1-5 shows this in detail.

**Figure 1-6: Shared Use Path Detail**



**Shared Use Path** – A pathway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Pedestrians, skaters, wheelchair users, joggers, and other non-motorized users may also use shared use paths. For shared use paths, the minimum width is 12 feet of paving for bi-directional travel, with a 2-foot

graded shoulder minimum on both sides of the path. Figure 1-6 shows this in detail.

**Pedestrian Facilities** - Sidewalks and walkways are “pedestrian lanes” that provide people with space to travel within the public right-of-way that is separated from the roadway vehicles. They also provide places for children to walk, run, skate, ride bikes (where permissible) and play. Sidewalks are associated with significant reduction in pedestrian collisions with motor vehicles. Such facilities also improve mobility for and provide access for all types of pedestrian travel: to and from home, work, parks, schools, shopping areas and transit stops (source: Pedestrian and Bicycle Information

Center). More detail on the various classes of sidewalk facility accommodation within the Las Vegas Valley is provided under Existing Conditions in this document.

## 1.5 Walking and Biking as an Element of the Streetscape

### 1.5.1 Street Functions

A key concept for participation in walking and biking is that pedestrians and bicyclists are entitled to use the streets, because public funds are typically the primary funding mechanism used to construct them. Funding sources include: federal, state and local gas taxes –; auto registrations; sales taxes; property taxes; and special improvement districts or assessment areas. With the exception of limited access facilities, such as freeways, interstates and super arterials, pedestrians and cyclists are typically allowed on almost every roadway within urbanized areas. Streets serve many functions, including: (Source: *Pedestrian Safety Guide and Countermeasure Selection*)

- **Linkage:** They connect activities and places, parts of cities, one town to another.
- **Transportation:** They provide the surface and structure for a variety of modes. All modes and users should be provided for, including pedestrians, bicyclists, transit, motor vehicles, emergency services, and maintenance services.
- **Access:** They provide public access to destinations.
- **Public right-of-way:** Space for utilities and other infrastructure is an unseen function of the street
- **Space and place:** The street is as a definable place, a place for people to interact, the heart of a community. A street in this role may serve as a place for parties, fairs, parades and community celebrations.
- **Function:** Streets are often designed to emphasize some functions over others. At one extreme is a limited access highway which serves as a corridor for motor vehicle travel. At the other is a private cul-de-sac, which has no linkage and limited access. Many streets are designed so that certain desirable functions are not met. Examples include commercial streets where access to destinations is difficult and strip development along high-speed roads where no sidewalks or pedestrian crossings exist.

There will be more detailed information on function provided later in the document under the heading – Identification of Strategies to Meet the Vision and Goals.

### 1.5.2 Walking and biking as transportation

Walking is the oldest form of transportation. Before people began using animals for transportation, walking was the only means of transport. For the most part, this ingrained mindset still exists and people often want to walk almost everywhere that they can. People walk to get to work, to run errands, to go to local stores, to get to transit, to get to eateries for lunch, with children to the local park and school, for exercise or even just for the enjoyment.



Biking has been around for some 100 years and has the advantage of being quicker than walking. One-half of all trips are less than 3 miles, only a 15 minute bicycle ride; however more than 85 percent of these trips are made by auto. (Source: *Pedestrian Safety Guide and Countermeasure Selection*)

People also walk and bike because they may not own a car and walking, biking and transit may be their only options. In the Las Vegas Valley 49,000 households do not own a car. Thus assuring that these facilities are adequate is an important step in assuring that all residents have mobility.

### **1.5.3 Walking and biking help to reduce congestion**

As discussed above, the demand for vehicular travel and the resulting congestion is both a local and national problem. Annual vehicle miles traveled is growing faster than the national growth in population. Every transportation bill passed since 1991 has sought to expand congestion reduction options beyond building more roads. The reason behind this philosophical shift is the recognition that the country cannot and should not build its way out of congestion. The long-term shortage of transportation funds may be the most obvious reason for the shift. However; this legislative trend also represents a conscious effort by Congress to make facilities more accommodating of walking and biking so that not only is vehicle congestion reduced, the coincidental benefits of curbing obesity and other life threatening conditions, improving air quality by reducing tail pipe pollutants, and saving money are increased..

The 'should not' refers to the recognition that just adding capacity above the existing system of roads is often not the best mobility solution. Alternative modes of travel, particularly when linked with transit, serve as viable options that can truly help to reduce congestion. Further, more roadway capacity can have a negative impact on a community and its lifestyle. Major roadways can create community barriers by dividing neighborhoods, reduce the likelihood of alternative mode travel if not designed adequately and dissuade walking and biking because of the higher speeds designed to enhance the movement of vehicles. The higher the roadway speeds the more unfriendly and incompatible streets are for alternative mode travel. Additionally, many cities line high-speed arterials with retail development thereby promoting auto travel and degrading access for non-motorized travel.

### **1.5.4 Walking and biking help to improve air quality**

The Las Vegas Valley is in non-attainment for three of the six air quality criteria pollutants established by the National Ambient Air Quality Standards (NAAQS). Non-attainment is the term used to describe a region that is currently exceeding the standards set in the NAAQS. The Las Vegas Valley is in non-attainment for the following pollutants:

- Carbon Monoxide (CO)- about 80 percent of all CO pollution comes from vehicle tailpipes,

- Particulate Matter less than 10 microns in diameter (PM<sub>10</sub>) commonly referred to as dust – about 65 percent of all PM<sub>10</sub> emissions come from tires picking up dust from the road,
- Ozone (O<sub>3</sub>) is created by the sun from volatile organic compounds (VOCs) and nitrogen oxides (NO<sub>x</sub>) – about 35 percent of all ozone precursors come from vehicle tailpipes.

Note: the non-attainment area for ozone covers about 80 percent of Clark County.

This year vehicles in the Las Vegas Valley are projected to emit 178,342 tons of CO, 29,200 tons of PM<sub>10</sub>, 28,965 tons of NO<sub>x</sub>, and 19,103 tons of VOCs. Walking and cycling are pollution free modes of travel, which can substantially assist in reducing vehicular related emissions. Transportation Plan Conformity details information on the process the RTC must undertake to assure that the plans for the transportation system do not cause any future violations of the standards.

### **1.5.5 Walking and biking are healthy activities**

Both walking and biking are healthy activities. It is recommended that people get at least 30 minutes of exercise daily, 60 minutes is preferable. Walking and/or cycling to work, shopping, school, transit and other nearby destinations helps reach these minimums. The following facts are provided as additional incentives to choose walking and biking.

- 50 percent of all trips are less than 3 miles, which is only a 15-minute bicycle ride, however 85 percent of these trips are made by vehicle (Source: *Pedestrian Safety Guide and Countermeasure Selection*)
- 25 percent of all trips are less than 1 mile, which is a feasible walking trip, however 75 percent of these trips are made by vehicle (California Public Health Program – CPHP)
- Air pollution contributes to over 70,000 deaths in the U.S. each year (Harvard School of Public Health)
- 78 percent of children fall short of the recommended minimum dose of activity: 60 minutes a day (CPHP)
- 35 percent of children watch 5+ hours of TV a day (CPHP)
- Children don't walk any more: 1970 – 70 percent of children walked or biked to school; in 2007 – only 16 percent of school aged children walked or biked to school (FHWA)
- In 2007 it was determined that twice as many children are overweight than in 1980
- The U.S. Center of Disease Control (CDC) estimates that:
  - 1/3 of all who are children today will become diabetics
  - Their life span may be shortened by some 15 years
  - Directly related to obesity, this is the first generation in history who may not live as long as their parents

### **1.5.6 Walking and biking are inexpensive forms of transportation**

As gas prices continue to climb above the \$3 dollars a gallon mark, a greater percent of household expenditures is being consumed by transportation. Walking is free and the cost of biking is only the purchase of the bike, helmet, and minor maintenance expenses such as tires, chains and lights. The use of a vehicle is significantly more expensive. Very conservatively and just considering the journey to work as a point of comparison, it is estimated that an auto costs about \$3,592 dollars per year to operate when traveling to work.

Note: Assumptions include - 5 years of ownership; \$12,000 purchase cost; \$500 insurance cost; 35 miles per gallon; 5,000 miles per year, \$50 in taxes; and \$200 a year maintenance cost; fuel \$3.10 per gallon.

## **1.6 Factors Influencing Compatibility for Walking and Biking**

As discussed above there are many reasons to walk and bike. On the other hand, there are other factors that can play a role in the individual's decision to choose alternative mode travel; many of these factors relate to the comfort, safety, ease of movement and connectivity of the facilities. The RTC is aware of and is working to address and improve many of the conditions related to the factors identified below. The framework that guides the agency's strategy is rooted in the RTC's - BPE Vision Statement and Goals, listed in the following section. The specifics of the various programs, projects and policies underway to assist in achieving the BPE Goals are discussed in Identification of Strategies to Meet the Vision and Goals.

### **1.6.1 Key Factors Influencing Walking and Biking**

Many people site weather as a determining factor for not walking or biking. While the climate in the desert southwest is often warm to hot during summertime, the average temperature in Las Vegas is less than 70 degrees. One of the advantages of the Mojave Desert is its dry air that allows shorter cool down time and increases the body's ability to cool itself. When humidity reaches 70 percent the body loses its ability for evaporative cooling – the key reason why people sweat.

Another beneficial aspect of Las Vegas' climate for walking and biking is the lack of rainfall; Las Vegas receives approximately 4 inches of rain per year which principally falls during from late July through August and during the winter with the passage of Pacific Storms. Consequently, Las Vegas has a substantial advantage over many cities; alternative mode travelers do not have to worry about wet surface conditions and related safety issues or raingear for most of the year. Additionally, winters in Las Vegas are mild and there is no is measurable snow.

### **1.6.2 Distance and Time**

While these factors are often cited for not walking or biking, for many trips this should not really be an obstacle. One quarter of all trips are less than one mile; and one half of all trips are less than three miles. At a normal walking pace, a one mile journey takes

only twenty minutes. When considering those trips at or below three miles, the bicycle journey takes about 15 minutes – even pedaling at a modest pace.

### **1.6.3 Roadway Design Issues that Impact Walking and Cycling**

As discussed in the Introduction to this document, much of the transportation planning emphasis has been narrowly focused on accommodating vehicle infrastructure and high speed travel. Following World War II and continuing through the late 1970's many urbanized areas did not consider alternative mode travel within long-term facility planning and design. Once a facility is constructed, it is difficult to make corrective changes to the infrastructure; appropriate design and accommodation strategies to reduce impediments and conflicts to walking and biking are most effectively considered at the planning and design stage.

#### **Wide Travel Lanes/Travel Speeds**

While wide travel lanes can move vehicles at higher speeds, higher speeds are less safe. In an FHWA study addressing roadway width and its relation to anticipated accident rates per year per mile, it was determined that wider streets experience higher rates of crashes per mile. For example, at 25 mph, the accident rate is 0.04 accidents per year per mile and jumps to 0.14 at 35 mph.

High vehicle speed is detrimental to all modes but particularly for pedestrians and cyclists. Of all of the vehicle/pedestrian crashes occurring at 20 mph, only about 4 percent are fatal. When a pedestrian is struck at 30 mph the fatality rate climbs to 40 percent, to 80 percent at 40 mph, and to 100 percent fatal when a pedestrian is struck at 50 mph. In addition to the greater risk of death, high vehicle speeds are uncomfortable to the adjacent to walker or cyclist, are louder and are generally avoided, except when a large enough buffer zone is provided.

Wide travel lanes also take longer to cross when walking. A 100-foot-wide facility takes almost 30 seconds to cross at the average walking speed which is 3 feet per second. These wide streets certainly increase the exposure rate of vehicles to both pedestrians and cyclists.

#### **Access**

Access to land uses located on the roadway network is often a contentious issue. Without direct access from the roadway, the adjacent developments/businesses worry about value. At the same time, too much access will increase the number and frequency of conflicts, reduce roadway capacity, and create impediments to development access for both vehicle and alternative mode travel. The following is a discussion of the potential impacts related to access issues.

#### **Driveway Frequency**

Without exception, as the number of driveways per mile increases in the urban environment, so do the conflicts. Fewer driveways spaced farther apart allow for more orderly merging of traffic and present fewer challenges to drivers, pedestrians and cyclists. Through research, the FHWA has concluded that there is a strong linear

relationship between driveway frequency and conflicts. For example, roadways that have 20 or less driveways per mile experience 4.0 crashes per million miles traveled. When driveway frequency is between 20 and 40 per mile, the anticipated number of crashes climbs to 6.6 per million miles. When the numbers of driveways increase to 40-60 per mile, the number of crashes rises to 8.0 per millions of miles traveled.

### Role of Medians

Along with driveways, the type of median applied on a roadway has a direct bearing on the number of conflicts and corresponding crash rate. For example, undivided roadways can expect to experience 9.0 crashes per million of miles traveled; two-way left turn medians experience about 7.0 crashes per million miles traveled, and the rate goes down to 5.5 crashes per million miles traveled for raised medians. Medians also help to provide the pedestrian and cyclist a place of refuge from adjacent vehicle movement that enhances both perceived and actual safety.

### **Lateral Separation/Adequate Width**

As discussed above, higher vehicle speed typically discourages selecting the walking or biking option. The preferred answer is to lower travel speeds, but this is not always a viable option. One important feature that can improve pedestrian comfort is a border between the street and the sidewalk area. This border area can include street furniture, landscaping, or curb lane parking..

### **Adequate Corners**

Intersections are places of high conflicts within urbanized areas. As discussed above, wide intersections can increase the exposure rate of accidents for pedestrians and cyclists, can be uncomfortable to cross and may not be able to be crossed during a single walk phase of the traffic signal. Therefore, provisions to enhance the movement for all modes of travel with some special provisions for pedestrians and cyclists will improve safety. For example, many cities have opted to allow cars to turn right on red (ROR). The strategy helps to improve flow; however, the ROR has a high crash rate for pedestrians.



One solution is to create a two step pedestrian crossing; the first across a free flow right turn lane to an island that provides a pedestrian refuge to wait for the green crossing cycle. Another option is to 'bulb out' the intersection to reduce the crossing distance, which also has the effect of slowing down approaching vehicles. Another inexpensive option may be to prohibit RORs during a.m. and p.m. peak periods. No matter

what option is selected, the presence of some form of refuge at the intersection is absolutely essential for pedestrian and bicycle safety.

### **Facility Condition**

Almost intuitive to the subject of accommodating alternative modes is the need for well maintained facilities. Sidewalks with uneven surfaces, overgrown landscaping, and object related obstacles all degrade the walking experience and may cause lower participation rates. Well maintained, smooth and even walking surfaces are the essential prerequisites for walk friendly environment. For cyclists, bike lanes must be smooth, free of obstructions and well defined. Bike lanes and shared use curb lanes for bike routes must be frequently swept and inspected to ensure adequate surface conditions.

### **Continuity/Connectivity of Systems**

Bikeway and pedestrian facilities benefit from the same consideration given to roadway infrastructure. Cities and counties do not plan to build roadways that terminate abruptly and do not link to the other parts of the system. Alternative mode facilities benefit from the same continuity/connectivity of systems that to provide a reliable network of infrastructure for non-motorized options. Consistency among entity design requirements is assured through regional adoption of AASHTO Bicycle and Pedestrian Facilities Guidelines into the Clark County Area Uniform Standard Drawings.

## **2 Vision and Goals**

The purpose of the vision statement is to concisely define what the BPE is seeking to accomplish.

### **BPE Vision Statement**

*The RTC's vision is to provide for a regional alternative mode network consisting of paths, enhanced sidewalks, bicycle lanes and routes that form an interconnected, non-motorized transportation system for the Las Vegas Valley. The system shall be designed, built and maintained in a manner that provides viable and safe alternatives to motorized travel, linking the community's residential areas to public facilities and transit to areas where residents work, attend school and where both residents and visitors recreate and shop.*

### **2.1 Goals Related to Walking and Bicycling - BPE Focus Areas**

As discussed previously, the BPE is an Element of the overall Regional Transportation Plan (RTP). As such, the goals for the BPE are rooted in the master set of goals adopted as the overarching direction for the agency. There are nine (9) RTP Goals and related Objectives and Measures of Effectiveness established by the RTC

The Goals all relate the RTP's Master Vision Statement which is to:

*Provide a safe, convenient and effective transportation system that enhances mobility and air quality for citizens and visitors.*

The RTP Master Goals are as follows.



- Goal 1. Implement transportation systems that improve air quality and protect the environment.
- Goal 2. Develop fully integrated modal options.
- Goal 3. Enhance the efficiency of existing transportation facilities.
- Goal 4. Improve access to mass transportation facilities and services.
- Goal 5. Secure funding for expansion, operations and maintenance of systems and routes.
- Goal 6. Enhance public awareness and support of the regional transportation system.
- Goal 7. Improve safety for all travelers.
- Goal 8. Improve security for all travelers.
- Goal 9. Support more efficient freight travel.

several of the Goals focus on cycling and walking. The BPE uses the Master list of Goals to define 'BPE Specific Goals' that define various strategies that align with the intent of the related RTP's Goals, particularly Goals 2, 3, 4, 7, and 8.

## **2.2 BPE Specific Goals**

Many of the BPE Goals relate to the improvement of conditions for many of elements that influence walking and biking. (See Section 1.5 Factors Influencing Compatibility of Biking and Walking above.)

- Assure that the demand for Bikes on Buses and other mass transit modes can be fully accommodated
- Assure availability of facilities that can secure bikes at transit terminals
- Assure availability of facilities that can secure bikes at places of employment
- Assure that pedestrians and bicyclists are provided continuous access to transit
- Work with local jurisdictions to create portals within subdivision walls to allow access to transit and other regional destinations
- Improve tools to better evaluate, manage, implement and maintain alternative mode facilities
- Develop pavement condition evaluation methodology
- Develop a process to review bicycle facilities to determine appropriateness of facilities with relation to changes in land use or roadway characteristics
- Monitor the use of Question 10 funds for maintenance of Shared Use Trails
- Reduce pavement cuts
- Reduce the number of pedestrian and bicycle crashes across the Las Vegas Valley
- Develop applications to view, evaluate and define mitigation for high crash locations
- Work with local jurisdictions to develop or implement enhanced regional street/sidewalk design standards that safely accommodate alternative mode travel
- Provide a reliable and adequate source of funding to implement non-motorized travel facilities in the Las Vegas area.

### 3 Review of Existing Conditions

The purpose of addressing 'existing conditions' for walking and bike travel is to provide the reader with detailed information on the status of the Las Vegas Valley in relation to alternative mode accommodations. This section of the BPE provides information on identification of the adopted Bicycle Master Plan, implementation status of existing bicycle and pedestrian facilities, identification of funding sources, policies in place for facility selection, alternative mode demand and its relationship to land uses, status of projects and an overview and discussion of crash data involving pedestrians and cyclists.

#### 3.1.1 Las Vegas Valley Master Plan for Non-motorized Facilities

##### Adopted Bicycle Facilities

As discussed previously, following two years of meetings and discussions with member entities, the Nevada Department of Transportation, and multiple public meetings including a 90-day public comment and outreach period, the RTC adopted the Alternative Mode Master Plan in 2003. The Master Plan defined long-term facilities for bicycle lanes, bicycle routes and shared use trails. Using the process listed below, the RTC has made some minor modifications to segments on the adopted network; however the extent of the network and its system connectivity remain unchanged from

**Table 3-1: Adopted Facilities by Type**

Facility Type	Number of Miles
Bicycle Lanes	690
Bicycle Routes	390
Shared Use Travel Lanes	760

the adopted facilities network from 2004. The map of the adopted network is illustrated in Figure 3-1. The Master Plan adoption includes the facilities are displayed on Table 3-1: Adopted Facilities by Type

**Table 3-2: Constructed Facilities by Type**

Facility Type	Number of Miles
Bicycle Lanes	192
Bicycle Routes	82
Shared Use Travel Lanes	107

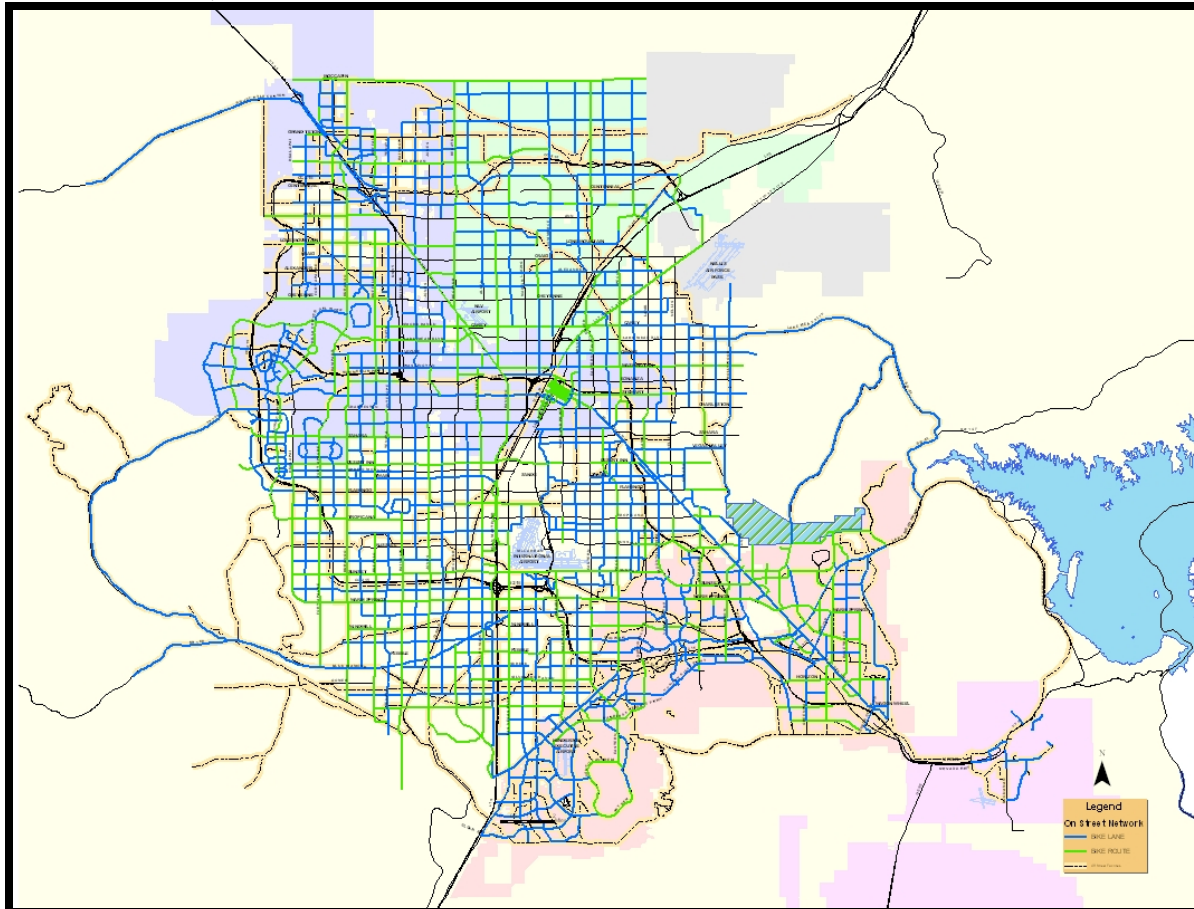
##### Constructed Bicycle Segments

More discussion regarding the location of facilities programmed for construction as part of the 2009-2030 RTP will be discussed in more detail in Section V-Progress of

RTC's Adopted Goals. The bikeways displayed on Table 3-2 have been constructed.

Full color, detailed maps of both the Adopted and Existing Las Vegas Valley Master Plan can be reviewed and printed from the RTC's website at: [www.RTCSNV.com](http://www.RTCSNV.com).

**FIGURE 3-1: Las Vegas Valley Master Plan of Bicycle Facilities: Lanes, Routes, and Shared Use Trails**



Legend: Lanes = Blue; Routes = Green; Shared Use Trails = Beige

### 3.1.2 Facility Selection

Since most of the roadway network in the Las Vegas Valley is bicycle compatible, the RTC's nomination process focuses on the most suitable streets for long-term use as bicycle facilities. The intention of the agency is to select roadways that safely accommodate non-motorized travel across as much of the roadway network as is feasible. If the street segment meets the criteria listed below, then it is eligible to be adopted into the BPE network.

- Continuity – Segments that connect roadways in the network.
- Accessibility – Roadways that can be accessed with few or no direct motorized conflicts. This issue is of particular importance for roadways adjacent to residential areas, schools, shopping and large activity centers.
- Directness – Facilities that keep route deviations to a minimum and maintain the integrity of the facility's alignment.

- Posted Speed – Except in rare or necessary circumstances, bikeways are identified on streets with posted speeds of 35 miles per hour or lower.
- Transit Access – Routes should be near one-quarter mile or less from fixed route transit.
- Surface Conditions – This criterion refers to the actual condition of the ‘tread’ of the roadway. In addition to problems that disrepair can cause cyclists, the selection ensures that there are no unusual street or drainage features that could cause a potential loss of control by the cyclist.
- Truck Traffic – Although no threshold number is included, the RTC will not adopt bikeway segments that are known to have a high volume of truck traffic.

#### Policy factors considered in bicycle facility selection

- Each implementing entity will ensure a proposed bicycle facility will not create an unsafe condition for the cyclist, pedestrian or motorist. If the unsafe determination is made, the segment will be removed and an alternate route considered.
- Implementation of a bikeway segment will not eliminate any existing travel lanes or reduce the number of travel lanes the roadway was designed to accommodate. If the recommended bicycle facility can not fit within the right of way, an alternate route should be considered.
- The preference is to locate bicycle facilities on roadways with an 80-foot right-of-way or less.
- Implementing bicycle lanes or routes will be accomplished within the existing right-of-way.
- The project will not modify any existing median configuration to “fit” the designated bicycle facility.
- Implementation of bicycle facilities requiring reduction in the existing travel lanes to 11 feet to accommodate bicycle lanes will be done only as part of the entities’ regular scheduled resurfacing program or as part of a TIP capital project.
- Installation of bicycle facilities will not be contingent on the removal of existing on-street parking.
- Entities shall refer to the adopted Bicycle Master Plan when considering any roadway overlay or CIP project. When installing adopted bikeways, entities shall apply the most recently approved bicycle facility designation as defined in the RTP.

### **3.1.3 Facility Modification - Bicycles**

A modification refers to the change of a facility type from a bike lane to a route or vice versa. Facility removal proceeds according to the same process. The RTC works within the Alternative Mode Working Group to bring potential facility modifications to the Commission for consideration. Either the RTC or a member entity can identify a facility for modification. The requesting agency is asked to define in writing the problem or circumstance that has motivated the request. For example circumstances may include safety related to high crash locations; changes in conditions such as new development, driveway closures, speed limit changes; or the introduction of a school zone.

If agreed to, the RTC staff opens a 45-day public comment period, holds a public hearing, advances the amendment through the advisory committee process and forwards the recommendation to the Commission. If approved, the RTP amendment, termed a BPE segment modification, is posted on the RTC website and information is amended on the bicycle Master Plan and the public Regional Bike Map when reprinted.

### **3.1.4 Pedestrian Facilities**

Unlike the Bicycle Master Plan there is no formal master plan for sidewalks in the Las Vegas Valley. This is because each of local development code provides for sidewalks at least for roads classified as collector and above. The discussion on existing pedestrian facilities therefore focuses on the various types or classes of sidewalk design across the urbanized area.

#### **Process used in facility identification**

The RTC collected information on sidewalk types using a product known as Street Digital Imaging. The procedure involves driving each of the Valley's streets with cameras mounted atop a vehicle that is coordinated to latitude and longitude data. The link to the coordinate data allows RTC staff to view and measure the roadway features. These images are an interactive site on the RTC's website. Go to <http://www.rtcsonthernnevada.com/bicyclemap/bikemap.htm>, then click on Bicycle Map & Virtual Tour.

#### **Sidewalk Types**

For the purposes of the inventory the RTC has categorized the various sidewalks into four types or classes. The classes are organized from most compatible (Class 1) to least compatible (Class 4) for pedestrian movement. The identification of class type is rooted in the 'compatible' attributes of the sidewalk that make the walking experience desirable. Sidewalks are most desirable to use when they provide adequate walk space, a buffer from the building or block wall that forms the edge of the right-of-way, and a buffer from the streets to reduce the friction felt by the movement of adjacent vehicles. The following is a brief definition, defined from the edge of the right-of-way to the start of the curb travel lane for motorists. The description of sidewalk class is followed by Figure 3-2 displaying examples of each class.

Class 1 is distinguished by two key features: a landscaped buffer between the block wall and the sidewalk and another buffer between the sidewalk and the curbside travel lane.

Class 2 is same as Class 1 except there is no buffer between the sidewalk and the curbside travel lane.

Class 3 is distinguished by the absence of any buffers and typically has the sidewalk abutting the block wall with no separation from the curbside travel lane

Class 4 is where there is no sidewalk in place.

**Figure 3-2: Sidewalk Class Illustrations**



**Class 1**



**Class 2**



**Class 3**



**Class 4**

Using the digital imaging process discussed above the RTC collected the data on all of the sidewalks on roadway designated as collector and above. The results, listed in miles by sidewalk class are as follows.

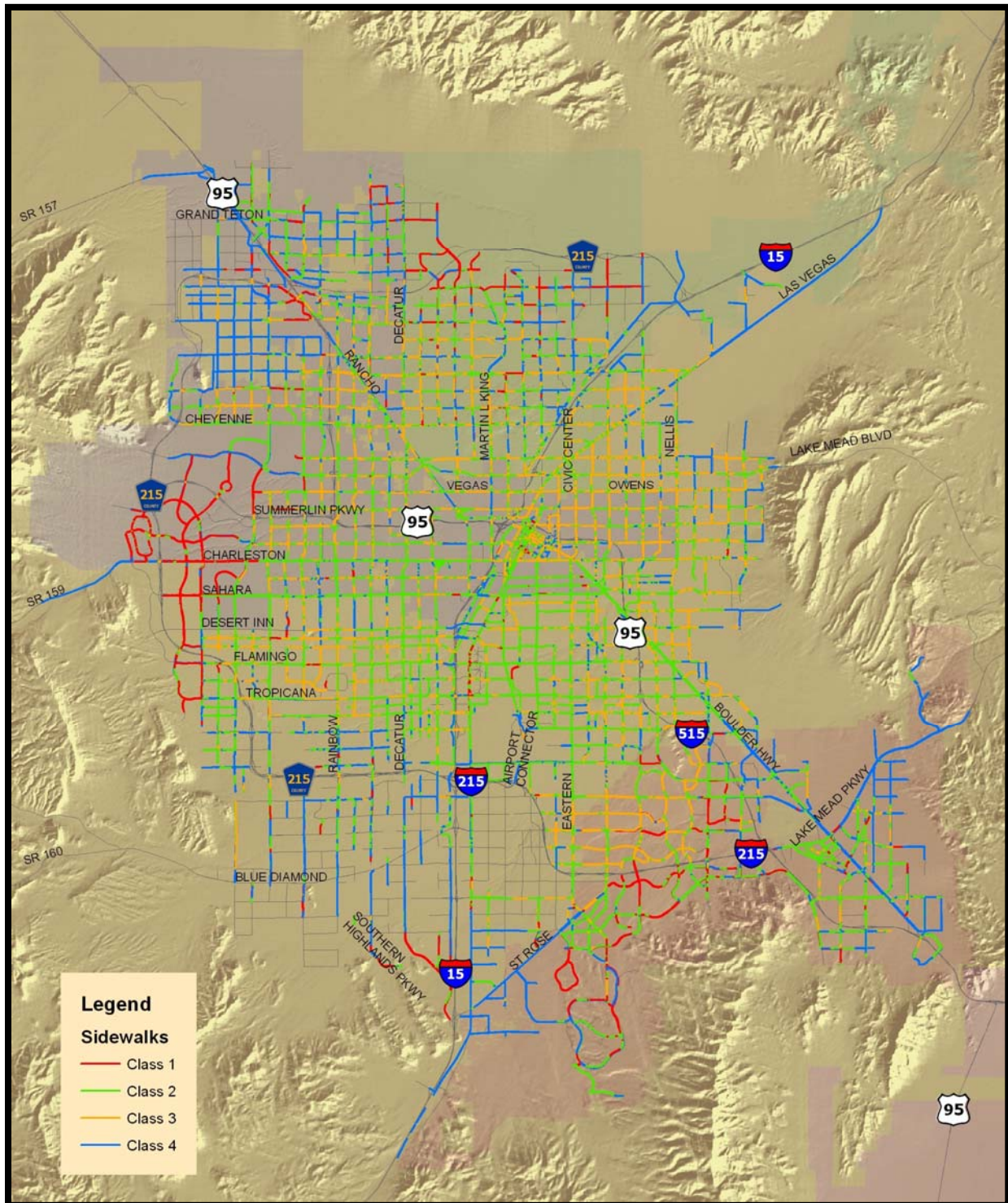
Class 1: 172 miles  
Class 2: 861 miles  
Class 3: 515 miles  
Class 4: 591 miles

### **Location of sidewalk types**

Following the collection of the sidewalk class types, the RTC developed a map of the Valley to illustrate the physical location of the sidewalk classes. Later in this document there will be a discussion related to the analyses of the sidewalks as it relates to exiting or anticipated high density pedestrian movement areas. Figure 3-3 provides the reader with an overview of the location of sidewalks classes juxtaposed with a Valley wide map.



**Figure 3-3 – Location of Sidewalk Types**



### **3.1.5 Inventory of Driveways and Medians**

During 2007, RTC staff also collected information on the physical location of driveways and medians, since these two features can have a bearing on cycling and walking

safety and the overall experience. Listed below are the criteria used by the RTC to link the inventory with the FHWA's definitions based on frequency; this is followed by Figure 3-4, a consolidated map displaying the results of the feature inventory process. , More detail is provided on how this data will be used by the RTC to improve conditions for walking and cycling in the section entitled Identification of Strategies to Meet the Vision and Goals.

### **Driveway Frequency**

Without exception, as the number of driveways per mile increases in the urban environment, so do the conflicts. As discussed above, fewer driveways per mile allow for more orderly merging of traffic and present fewer challenges to drivers, pedestrians and cyclists.

### **Role of Medians**

As discussed above, the type of roadway median has a direct bearing on the number of conflicts and corresponding crash rate. Medians help to provide the pedestrian and cyclist a place of refuge from adjacent vehicle movement that enhances both perceived and actual safety.

FIGURE 3-4 Frequency Map of Driveways and Median Types on the Las Vegas Valley Roadway Network

## **3.1.6 Documenting Alternative Mode Demand**

### **Estimating Future Non-Motorized Travel Demand**

Implementation of the Alternative Transportation Mode Master Plan, 2006-2030 Regional Transportation Plan will result in 586 miles of bicycle lanes, 309 miles bicycle routes, and 689 miles of Shared Use Paths in twenty years at a cost of \$50 million. The new bicycle facilities will be more concentrated in a North/South direction south and west of the resort corridor in the southern end of Clark County and in the City of Henderson.

The 2006-2030 RTP projects seek to extend alternative modes of travel by linking some bicycle facilities to the farthest-reaching points of transit service, having a transit link intersect the facilities, or, at minimum, be within a 400-yard radius of the facilities. Some routes will be directly on transit commuter corridors such as the Boulder Highway corridor from the City of Henderson to Downtown Las Vegas.

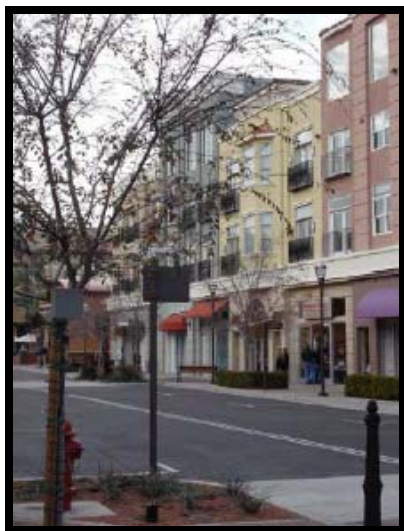
One of the goals of the Alternative Transportation Mode study is to increase the share of the commuter bicycle trip mode to at least 3 percent from 0.3 percent. The 70 to 80 miles of bicycles lanes and routes and 40 miles of paths to be added to the alternative mode systems each year will link bicycle travel with existing and planned transit, commuter express routes, and park and ride lots. Walking to work is even more

popular. Almost 2 percent of Valley residents walk to work. Creating additional pedestrian links between residential areas and places of employment is another goal.

### **Innovative Land Planning Policies within the Las Vegas Area**

Streets conducive to biking and walking have lower auto speeds, fewer driveways, wider sidewalks, bike facilities, better access to transit, and a de-segregation or re-mixing of land uses within the development that allow shorter trips between residential and commercial areas often resulting in increased non-motorized travel and a reduction in vehicle trips. The RTC has worked with member entities to widen sidewalks, increase the landscaping buffer zone, reduce driveway openings at developments and add over 1,750 miles of adopted on-street bikeway and 660 off-street shared use trails. This has all been done in the context of the existing model of land use which is dominated by strip commercial, segregated land-uses and residential areas that erect block walls that serve as barriers to walking and biking.

Over that past three to five years there has been a general move towards better integration of alternate mode and automobile facilities, which the RTC fully supports. Below is an identification of land use planning and zoning review activities at each of the entities, including a discussion on the impact to non-motorized travel.



#### City of Henderson

The City of Henderson land use plan has incorporated a progressive livable community vision and goals into their land use development policies. The City of Henderson land use policies seek to seamlessly integrate new infill and redevelopment projects into older districts to promote attractive mixed use developments. Land use policies seek to take advantage of transit related opportunities by promoting Transit Oriented Design standards in appropriate locations. New developments must include transit supportive design features.

The City of Henderson's downtown, activity centers, shopping areas, and transit stations give equal consideration to pedestrian and bicyclist during design. The land use design considerations provide direct walkways and bicycle routes to school, park, and community facilities.

Mixed use development land use policies provide a variety of high density residential uses designed to offer a variety of transportation options, including transit,

**Table 3-3: City of Henderson Bicycle Network**

Facility Type	Number of Miles	
	Existing	Programmed
Bicycle Lanes	18	97
Bicycle Routes	3	74
Off-Street Paths	34	194
Total 420	55	365



walking, bicycling, as well as vehicle travel. Table 3-3 summarizes the City's Bicycle Network.

### City of Las Vegas



The Las Vegas 2020 Master Plan establishes future land use policies decisions and related aspects of corporate planning in the City of Las Vegas through 2020, including smart growth development policies for improving jobs/housing balances. The Master Plan establishes a greater mix of housing types that includes affordable housing with significant Downtown housing and employment increases.

The Master Plan policies and implementation measures include a strategic plan with three geographic strategy types called the Downtown Central Plan, Neighborhood Revitalization Areas, and Newly Developing Areas. The geographic strategies seek to integrate existing development with mixed uses and densities that support high quality transit service, including transit serving the Downtown and the Strip.

**Table 3-4: City of Las Vegas Bicycle Network**

Facility Type	Number of Miles	
	Existing	Programmed
Bicycle Lanes	37	106
Bicycle Routes	36	75
Off-Street Paths	11	82
Total 348	85	263

The three geographic strategies focus on reducing the demand for transportation services by improving the balance between jobs and housing through creation of options for people to live and work within walking or bicycling distance of their work. The City of Las Vegas has four of the seven employment nodes in the central Valley. Table 3-4 summarizes the City's Bicycle Network.

### City of North Las Vegas



The North Las Vegas Comprehensive Future Land Use Plan's guiding principles are driven by a balanced mix of land use policies with an integrated multi-modal transportation system. The future land use plan is divided into three new development

types: Master Planned Communities, Mixed-Use Development, and Transit-Oriented Development. Residential neighborhood land use polices and design criteria include pedestrian friendly access and transit links to the community and surrounding areas.

**Table 3-5: City of North Las Vegas Bicycle Network**

Facility Type	North Las Vegas		Shared with City of Las Vegas	
	Existing	Programmed	Existing	Programmed
Bicycle Lanes	0	99	0	3
Bicycle Routes	2	41	2	7
Off-Street Paths	0	46	0	1
Total 201	2	186	2	11

Land use policies for Future Activity Centers seek to implement a design pattern of high density mixed use development that supports live-work opportunities in residential and business environments linked by non-automotive travel. The land use polices for the

North Fifth Street corridor are based on Transit Oriented Design principles of dense mixed use environments that support pedestrian and bicycles activities with transit services.

The Employment District Plan is made up of the Cheyenne Technology Center and the I-15 corridor industrial lands. The Cheyenne corridor employment center has mixed use development polices and design criteria surrounded by supportive residential and commercial developments. The I-15 corridor plan seeks to retain industrial land uses through land use and design guidelines. The transportation and mobility component seeks to create access to employment centers by site design and densities that connect residents and employers by foot, bicycle and transit corridors. Table 3-5 summarizes the City's Bicycle Network.



#### Clark County Land Use Innovation

The Clark County Land Use Plan for the Valley is divided into two Volumes: General Subjects, and Land Use and Transportation. Mixed use and other development polices integrate bicycle and pedestrian systems with trails, open space and employment. The zoning ordinance includes a mixed use overlay district (MUD) that has been updated recently. The objective of the MUD Overlay is to encourage mixed use development and mobility choice particularly along designated corridors, such as Interstates

15 and 215, State Highways 160, 582 and 146, and Las Vegas Boulevard. All housing development policies seek to incorporate pedestrian and bicycle circulation systems that connect to schools, recreation and commercial areas.

**Table 3-6: Clark County Bicycle Network**

Facility Type	Number of Miles	
	Existing	Programmed
Bicycle Lanes	37	331
Bicycle Routes	49	170
Off-Street Paths	12	290
Total 889	98	791

The Strip is located within the unincorporated area of Clark County and provides the Valley's greatest concentration of employment. Pedestrian traffic levels are very high throughout the corridor. Employees are encouraged to use parallel corridors through the location of employee entrances at the rear of the hotel/casinos that line Las Vegas Boulevard between Russell Road and Sahara Avenue.

The Transportation Element seeks to integrate land use development policies and design guidelines with roads, alternative transportation choices for pedestrian, bicycles and transit routes. Table 3-6 summarizes the County's Bicycle Network.

#### Boulder City Land Use Innovation



Boulder City was originally designed to house Dam workers in the "Garden City" style that emphasized neighborhood and non-motorized travel. The Boulder City land use

**Table 3-7: Boulder City Bicycle Network**

Facility Type	Number of Miles	
	Existing	Programmed
Bicycle Lanes	7	1
Bicycle Routes	0	0
Off-Street Paths	11	1
Total 20	18	2

plan is committed to preserving this small town atmosphere with well defined boundaries for development. The City owns all undeveloped land within its boundaries and implements growth control through ordinances regulating land sales.

The City's land use policies seek to establish a compatible mix of housing choices, retail and service uses, and

employment centers to serve a range of community needs. Infill development and redevelopment are driven by policies that create compatible uses with existing development patterns in the existing urban area, particularly within the downtown. The density and intensity of new developments are guided by policies that seek compatibility with existing developments.

Boulder City's transportation element strives for a balanced transportation system that provides safe and efficient facilities for pedestrian, bicycles and automobiles in addition to regional transit connections. Table 3-7 summarizes the City's Bicycle Network.

### **RTC Effort – Improved Support Non-Motorized Travel**

#### Facilities

The RTC has two transit terminals, the Downtown Transit Center (DTC) and the South Strip Transfer Terminal (SSTT). Both the transit terminals provide safe and convenient access for pedestrians and bicycles. The transit stations provide a high level of security with lighting and a security guard present to monitor all access and boarding areas. Both terminals have secure, accessible bicycle stalls. Planned park and ride facilities include lighting, security cameras, bike racks, sheltered benches and bus ticket vending machines.

For the 2007 fiscal year the UPWP has programmed a project that can provide bicycle amenities in the work place to increase bicycle travel for work trips. A pilot program will install bicycle lockers and stalls in the three biggest employer sites in Clark County. The program is coordinated with the planned increase of bus bike racks from two to three racks for each vehicle. To promote bicycle and multimodal links, the BPE is seeking alternative funding for end-of-trip facilities such as stalls, storage lockers, trailblazer sign systems and shower facilities in areas of high employment concentration.



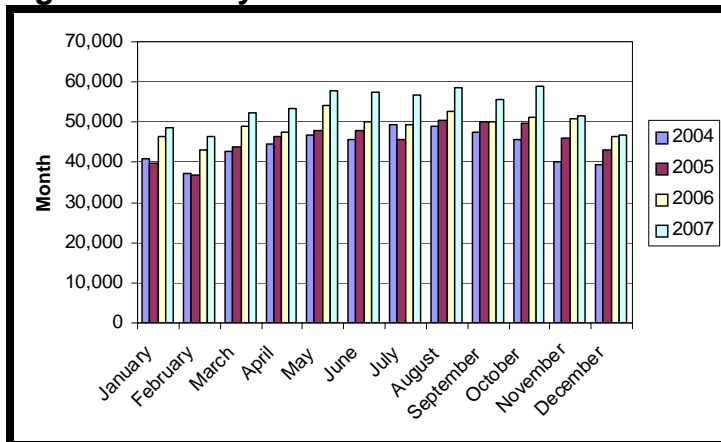
#### Alternate Mode to Access Transit

Since 1997, when the RTC installed bike carriers on all of the CAT buses, there has been a steady increase in passengers riding their bikes to the bus. This program has been beneficial because it directly improved travel accessibility across the Las Vegas Valley and made it feasible to travel longer distances by combining the two modes of travel. Demand has been so high that the pictured two-bike rack is now being

replaced with a three-bike rack. At the same time, bus service expanded to meet the more disbursed demand.



**Figure 3-5: Bicycles Carried on Bus Racks**



Source: Regional Transportation Commission, 2008

Figure 3-5 displays the number of transit riders who used the bicycle racks. The Clark County bike on buses data demonstrate a steady increase in bicycle travel linked to bus travel from a 43,000 average in 2004 to 54,000 in 2007. Approximately 64 percent of bikes on buses are work trips.

An on-board survey of transit passengers was completed at the end of 2006. Almost 7,000 of those surveyed were residents

of Clark County. As a percentage of passengers, those who bring bicycles remain at about 1 percent. Almost twice as many use a bicycle to get from the bus to their destination. About 92 percent of bus riders surveyed at the end of 2006 walked to or from the bus. Typically, the walk was two blocks or less, though about 15 percent walked more than that to their destination from the bus.

NDOT offers a survey on its website that includes a request for the respondent's zip code, so results from Clark County residents could be separately analyzed. (See [http://www.nevadadot.com/pub\\_involvement/](http://www.nevadadot.com/pub_involvement/)) As almost 40 percent of respondents ride a bicycle for commuting or recreation, it may be concluded that the potential for increasing bicycle commuting is quite high. Also interesting is that about 60 percent of those who ride bikes said they do not always use marked or signed facilities when they ride.

Lastly, as the price of gasoline rises, it may be expected that people will be more willing to consider alternate forms of transportation. Indeed, almost 50 percent of those Clark County residents responding to the NDOT survey report having already changed their driving habits, most by driving less.

## 3.2 Funding

The following is a brief discussion of the 2002 Question-10 Transportation Funding Initiative and SNPLMA, the two funding initiatives applicable to the BPE and how they have been applied to construct non-motorized travel facilities.

### Question 10

In 2002 the RTC went to the voters in Clark County to seek additional funding for transportation improvements within the urbanized area. The RTC identified a suite of activities that would be funded by the initiative including bus turn-outs, an increase in transit routes and more frequent service, improvement to the traffic signal timing hardware and software, funding of high-speed lane miles, the completion of the beltway



to Interstate standards, and \$50 million for the construction of on-street bike lanes and routes, plus \$62 million to be applied to maintenance of the Shared Use Facilities.

### **SNPLMA funds**

Discussed above, SNPLMA allows the BLM to sell public land and use the proceeds to fund trails, among other things. Much of the trails funding has been used to construct segments defined within the adopted Shared Use Trail network. The first set of projects was funded in Round 2 of the application process in 2000.

## **3.3 Safety**

The section addresses the major, planning, design and policy elements that impact safe conditions for walking and cycling – essential to understanding the underlying issues that make for a safe environment. This discussion is followed by a crash map that displays the location of crashes. The non-motorized crash information is summarized into a series of statistical observations that address the various characteristics for past collisions. Actions, initiatives and policies underway to reduce collisions by the RTC are discussed in Identification of Strategies to Meet the Vision and Goals above.

### **3.3.1 Key provisions of a safe non-motorized environment**

The American Association of State Highway Transportation Officials (AASHTO) states, in its 2004 Guide for the Planning, Design and Operation of Pedestrian Facilities, that the following factors impact pedestrian safety. These factors also apply to cyclists.

#### **Street Design**

- Streets must be designed to include adequate space for pedestrians. The facilities must be wide enough for the anticipated demand and must not locate obstructions to travel.
- Keep the number of travel lanes to a minimum. As the number of lanes increases, so does the complexity of the movement. Pedestrians must find gaps in the traffic to cross, which increases the exposure to crashes on wider streets.
- Keep travel speeds low. As speeds increase, so do the severity of injuries and number of fatalities. Where possible introduce some methods of traffic calming to help slow approaching traffic.
- Reduce the complexity of intersections. Skewed intersections, for example, increase the actual distance that the pedestrian and cyclist must traverse, increasing the exposure. Allowing right turns on the red phase also increases the threat of crashes as motorists are often distracted during congested periods and may not see the pedestrian or cyclist in time to react.

#### **Street Connectivity**

The layout of the street network has an impact on the ability to walk or bike. Connected local streets are essential to a compatible environment, since these streets can aid in providing access onto collectors and minor arterials, where people can walk or ride their bike to transit. A lack of street connectivity often results in intersections that are few in

number, but are usually large in size. The size, as reported above, is often detrimental to comfortable and safe crossing by pedestrians and cyclists.

### Site Design

Many big box stores and other types of retail are designed with the auto as the dominant access mode. These developments do not often provide convenient, direct or clear access for non-motorized travelers. Pedestrians have to find their own path through driveways, parking lots and landscaping to a particular destination.

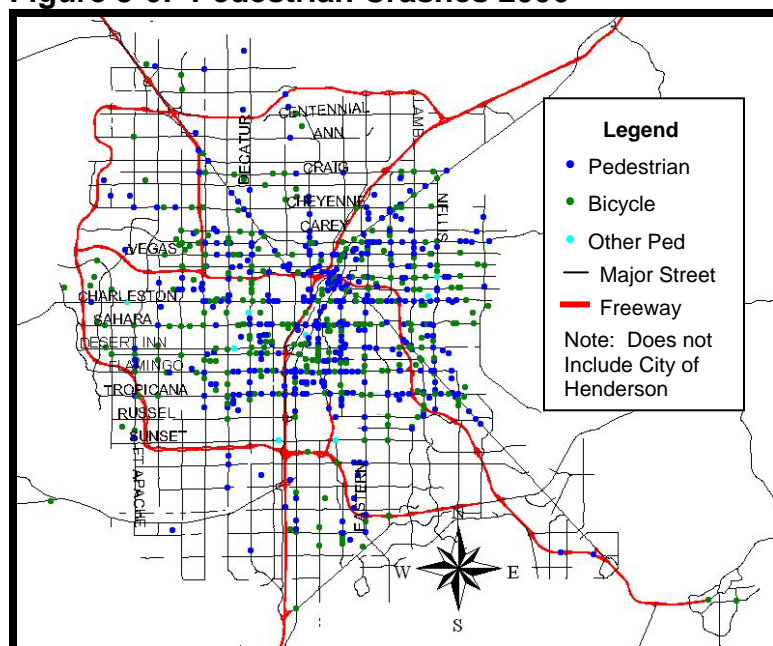
### Land Use

As discussed previously, the typical development practice of segregation of land uses has some unintended consequences that impact both non-motorized behavior and safety. One of the more detrimental consequences is that trip origins and destinations are farther apart, creating longer travel distances which leads to fewer people choosing to walk and bike. This places more cars on the road within activity areas, consequently raising the exposure to pedestrians and cyclist as they now have to cross busier streets. Safer non-motorized environments exist where there is a good blend of land uses and where walking and cycling accommodation is provided early in the planning phase of the project, not as an after thought.

### Access Management

According to AASHTO, access management “involves providing access to land development while simultaneously preserving the flow of traffic on the surrounding roadway system in terms of safety, capacity and speed” (AASHTO, 2001). In many urban areas, too much attention has been given to the auto and ease of access. This often results in; 1) frequently spaced driveways that create numerous conflict points for pedestrians and cyclists and 2) inadequate driveway designs that allow for the continuous movement of vehicles onto the street without having stop for foot or bicycle traffic.

**Figure 3-6: Pedestrian Crashes 2006**



### Pedestrian and Bicycle Crash Map

Displayed in Figure 3-6 are the locations of pedestrian and bicycle crashes in the Las Vegas Valley in 2006, except for those in the City of Henderson.

What is evident from this crash distribution map is that the majority of crashes occur on arterials where the speeds are higher and the roadways are wider.

## **Non-Motorized Crash Data**

The following information is a synopsis of the crash characteristics. The RTC has a Goal of reducing crashes by 20 percent by the year 2012.

## **Five Year Trends for Pedestrian Fatalities in Clark County**

There were 41 pedestrian fatalities in 2006,

- In 2005 there were 49,
- In 2004 there were 51,
- In 2003 there were 47,
- 2002 totaled 42 pedestrian fatalities and
- 2001 hit a ten-year low with 33 pedestrian fatalities.

## How Does the Las Vegas Valley Compare?

- 13 percent of pedestrian fatalities are caused by the pedestrian failing to obey traffic control devices.
- Nationally 1.47 percent of pedestrian fatalities occur this way.

## Why is the Number of Pedestrian Fatalities so High?

Pedestrians made up 14.8 percent of the total fatalities in 2006 in Clark County.

- Nationally that figure is 11.02 percent of all fatalities.
- Our pedestrian fatality rate is 2.6 per 100,000 population. The worst are Florida and New Mexico with a 3.2 rate. The best is New Hampshire with a .04 rate. The national average is 1.6.
- There are 10 states with a pedestrian fatality rate higher than 2.0.

## Who Is Involved in the Fatalities?

- Overwhelmingly, residents are involved in fatalities; the average for Las Vegas is 87 percent.
- Children in the age range from 10 to 14 are in third place.
- Seniors 65 and older are in second place.
- By far, with more than twice the fatalities, middle aged pedestrians 34-54 year old are in first place.
- Three-quarters of them are male.
- The highest number, 42.5 percent, of fatalities occurs between 6 p.m. and midnight. Another 27.5 percent happened between midnight and 6 a.m.
- The vast majority of nighttime crashes happen where there is "continuous roadway lighting" listed on the crash report
- One quarter of pedestrian fatalities happened under "light" conditions, and all but one of those happened before August.

## How/Where Are Pedestrian Fatalities Occurring?

- Half of pedestrian fatalities are reported as "In Roadway."
- Thirteen percent are in a marked crosswalk.
- Thirteen percent are in the median.
- Five percent are on the sidewalk.

### What is the Role of Alcohol in Pedestrian Fatalities?

- Nationally, 32 percent of fatalities have alcohol involvement.
- In Clark County in 2006 32.5 percent of pedestrians fatalities had drugs or alcohol listed as a factor in the crash. This could be the driver or the walker. An additional eight percent reported “unknown” drug or alcohol use. Twenty percent of crashes involving drug or alcohol use were listed as alcohol only.

## **3.4 Progress of Adopted Goals**

The following section summarizes the progress of the BPE Specific Goals and Strategies identified earlier in this report.

1. Assure that the demand for Bikes on Buses and other mass transit modes can be fully accommodated.

*The RTC's transit fleet is 100 percent outfitted with bicycle racks. During 2008, the agency will retrofit the entire fleet with 3-unit bike racks.*

2. Assure availability of facilities that can secure bikes at transit terminals.

*Both the RTC transit terminals provide safe and convenient levels of access for pedestrian and bicycles, a high level of security with lighting and a security guard and secure, accessible bicycle stalls. The planned Central City Intermodal Transit Terminal (CCITT) will be equipped with bike lockers, showers and secure lockers to support intermodal trips.*

3. Assure availability of facilities that can secure bikes at places of employment.

*The RTC is working with each of the local jurisdictions through the Alternative Mode Working Group to establish guidelines that will help to prioritize locations.*

4. Assure that pedestrians and bicyclists are provided continuous access to transit.

*The RTC has developed street standards for all classes of streets. Each design includes a sidewalk. Besides having over 1,200 mile of adopted on-street bikeways, almost 98 percent of the street network is cycling compatible. Since the requirement of 14-foot-wide curb lanes for all RTC projects, adopted in 1995, only two small street segments have been granted a wavier to the standard.*

5. Work with local jurisdictions to create portals within subdivision walls to allow access to transit and other regional destinations.

*The progress on the strategy has been slow. In 2008, the RTC rededicated efforts to work with various community partners to retrofit more subdivision walls with portals. The partners include, Safe Routes to School, Safe Kids Coalition, the cities and County and various homeowners associations.*

6. Improve tools to better evaluate, manage, implement and maintain alternative mode facilities.

*Digital imaging is one of the key strategies the RTC developed to better evaluate and manage bikeways and sidewalks. Images are collected using a vehicle equipped with multiple cameras capable of taking pictures in all directions every 18 feet. The pictures are located by latitude and longitude allowing agency staff to collect actual measurements and determine the locations of driveways, median types and sidewalks. Readers can take a virtual tour of the roadways imaged by going to the RTC's website at [www.RTCNV.com](http://www.RTCNV.com).*

7. Develop pavement condition evaluation methodology  
*Digital imaging allows for efficient visual inspection of pavement conditions.*
8. Develop a process to review bicycle facilities to determine appropriateness of facilities with relation to changes in land use or roadway characteristics.  
*See Existing Conditions above for a review of the system modification process.*
9. Monitor the use of Question 10 funds for maintenance of Shared Use Trails  
*In 2007 the RTC developed and adopted the following policy for the appropriate allocation of Question 10 funds.*

***POLICY FOR REIMBURSEMENT OF MAINTENANCE COSTS  
FOR OFF-STREET SHARED USE PATH (TRAIL)***

*This policy establishes criteria for the reimbursement of costs, through Question 10 (Q-10) funds, by the RTC for the maintenance of Off-Street Shared Use Path (Trail). The following criteria shall be met in order for expenses to be considered reimbursable by the Regional Transportation Commission (RTC):*

- 1) *The Off-Street Shared Use Path (Trail) shall be an adopted alignment of the Bicycle Pedestrian Element network. Twelve (12) feet of paving width is recommended for bi-directional travel with a two foot graded shoulder on both sides of the path. A path with less than 12 feet width is allowable with local approval when space is limited.*
- 2) *The maintenance activity reimbursement must be for facilities that comply with the design standards set forth by the Uniform Standard Drawings for Public Works' Construction Off-Site Improvement Clark County Area Nevada.*
- 3) *The reimbursement for maintenance costs applied to Off-Street Shared Use Path (Trail) shall be submitted every May by local entities to cover maintenance cost for the previous calendar year (July/June).*
- 4) *RTC reimbursement shall be limited to the maintenance activities within the right-of-way of the paved path (trail), including pavement markings, signs and safety lighting associated to the path (trail).*

5) *The RTC shall not reimburse landscaping and trail amenities such as lighting (except as a safety measure), power cost, water cost, benches, drinking fountains, etc.*

6) *In the case of an applicable Off-Street Shared Use Path (Trail) maintenance life cycle cost involving the resurfacing and/or asphalt overlay, an inspection and approval by the RTC will be required before any programming of the resurfacing project.*

*The reimbursement rate for the maintenance of Off-Street Shared Use Path (Trail) shall be no greater than \$8,000 per mile per year.*

10. Reduce pavement cuts

*The management of access is critical to a safe and comfortable experience. In 2008, the RTC will advance a Unified Planning Work Program Study to evaluate the entire roadway network based on the frequency per mile of driveways and median cuts. Moving from this document, the RTC intends to work with each of the local jurisdictions to improve conditions, through retrofits, consolidation and improved signage.*

11. Reduce the number of pedestrian and bicycle crashes across the Las Vegas Valley

*The RTC has been involved with the Nevada Strategic Highway Safety Plan (SHSP) since its inception in 2005. The plan seeks to reduce the number of fatalities by 1/3 by the end of 2008. The Program has established five emphasis areas: unbelted drivers, lane departures, impaired driving, intersections and pedestrians. The SHSP website is at [www.DriveSafeNV.com](http://www.DriveSafeNV.com).*

12. Develop applications to view, evaluate and define mitigation for high crash locations.

*The RTC has made substantial progress in this area. With the use of street digital imaging, the agency has been able to collect the key geometrics of the roadway network, providing the backdrop for evaluation of alternative mode crash data. The imaging allows the viewing of arterial or collector roadway the region. The next step in this sequential process is the development of a query-based crash data base, which is underway and will be ready for use by August of 2008. The RTC will, through consultation with the local jurisdictions, apply best practices to mitigate future crashes.*

13. Work with local jurisdictions to develop or implement enhanced regional street/sidewalk design standards that safely accommodate alternative mode travel.

*In 2003, the RTC advanced new street standards defined as Alternate Roadway standards. They are alternate in the sense that they may be applied in new development where the street segment can be constructed for at least one-half of a mile. The key non-motorized features include a wider sidewalk and a 2-foot dry utility buffer between the bike lane and the pedestrian way, which enhances the walking experience because it increase the distance between vehicles and pedestrians.*

*Entities can choose to landscape the buffer zone, however, every entity has adopted similar standards that include landscaping on the outside of the sidewalk. This is a significant change from the development when subdivision block walls were located directly at the sidewalk's edge. Because of the variation in right-of-way widths and the many design options for such things as parking, breakdown lanes and raised medians, there is great variation in roadway designs.*

14. Provide a reliable and adequate source of funding to implement non-motorized travel facilities in the Las Vegas area

*In 2002 the RTC identified a suite of activities that would be funded by revenues from the voter initiative reviewed in the Funding section above.*

### **3.5 Identification of Strategies and Initiatives to Meet the Vision and Goals**

This discussion is separated into long-term best practices and specific initiatives underway by the RTC. Long-term best practices address factors that influence walking and biking and the retrofitting/development of optimal physical roadway attributes to accommodate alternative mode travel. Much of the RTC long-term emphasis is based the information provided in the Introduction and Chapter I Introduction - Key Factors Influencing Walking and Biking and in the discussion entitled Key Provisions of a Safe Non-motorized Environment. Consistency among entity design requirements is assured through regional adoption of AASHTO Bicycle and Pedestrian Facilities Guidelines into the Clark County Area Uniform Standard Drawings.

The street design and operational factors are areas that the agency will remain committed to improving. By the end of 2008, the agency will have completed a complete inventory of all of these features. Improvements discussions will begin with the Alternative Mode Working Group and, as policies and retrofits are developed, the recommendations will move through the committee process for confirmation. The greatest constraint is that most of these features are already built, so are difficult to change. Therefore they can be viewed as part of ongoing RTC initiatives.

#### **3.5.1 Macro Focus Areas - Street Design, Operational and Policy Related Issues**

The background information related to the RTC focus issues has been reviewed above.

##### **RTC Focus – Addressing Wide Travel Lanes**

The RTC Master Bicycle Network segments are all located on minor arterials or collectors as a way to help cyclists avoid busier, higher speed facilities. While the RTC cannot define a master network of pedestrian walkways on calmer facilities, the agency will be working during the upcoming year to mitigate the impacts that the wider streets have on the pedestrian experience. The process will be initiated as part of the upcoming Development of a Las Vegas Area Pedestrian Action Safety Program project. Following review of inventory information, RTC will recommend improvements to streets with wide travel lanes. Recommendations may include cooperative work with entities to construct 'bulb out' of intersections to reduce pedestrian travel distance, to

reduce vehicle lane widths where traffic is consistently exceeding speed, and to reduce vehicle lane widths where practical.

### **RTC Focus - Lateral Separation/Adequate Sidewalk Widths**

The RTC has made good progress in the area. In 2004 the agency developed an “Alternate Standard” for the various right-of-way widths; the graphic for improvements is at [www.RTCSNV.com](http://www.RTCSNV.com). In each of the cases the sidewalk minimums have been increased to 8 feet and each include a 2-foot-wide ‘dry utility’ corridor between the street and the primary sidewalk. Entities can choose to landscape the dry utility corridor or they can develop colored pavers to help the separation from the curbside travel lane. While the standard is now voluntary, over the next year the RTC will work to make the Alternate Standard the new mandated standard. Additionally the RTC will work to prioritize possible streets that can be retrofitted to be more compatible for biking and walking. More information on the retrofit initiative is provided below.

### **RTC Focus - Adequate Corners/Intersections**

The RTC is working on several strategies to improve alternative mode accommodation, facilitate compatibility and reduce conflicts with vehicles as part of the Pedestrian Action Safety Plan development. Each intersection will be addressed individually and a master plan of improvements will be developed and adopted.

### **RTC Focus - Access Issues: Driveways and Medians**

Key to addressing improved accommodation and a reduction in vehicle/pedestrian and cyclist conflicts is to better manage the access provisions along roadways, specifically the number and frequency of driveways and the use and/or absence of medians. In 2009, the RTC will undertake a study to review, evaluate and develop recommendations that the local jurisdictions can use towards efforts related to access management, including driveway closures and consolidations within large developments, standards for proximity of driveway near intersections, the construction of raised medians where none exists, possible closure of median openings that are determined to be detrimental to alternative mode accommodation or that have high vehicle crash numbers.

### **RTC Focus - Operational Issues: Travel Speed, Facility Condition and System Connectivity**

Travel Speeds – As part of the access management study and the development of a Pedestrian Action Safety Program, the RTC will comprehensively address posted speeds on roadways within the Las Vegas Valley. This process will include an analysis of the relationship between speeds and the frequency and severity of crashes for both vehicle only incidents and for vehicle on pedestrian and cyclist crashes.

Facility Condition – This is ongoing use of digital imaging to assess roadway/sidewalk condition. In 2008/09 the RTC will add a feature to the website where users can identify problems or impediment to walking and biking.

Continuity/Connectivity of Systems – This process chiefly involves the use of digital images to identify ‘gaps’ in the network. Once identified, the RTC will work with the responsible local entity to develop a strategy to close the gap.



## **RTC Focus - Policy Related Issues: Accommodating Alternative Mode Travel in Site Design and Land Development**

This is an ongoing process. The local entities voluntarily provide the RTC with development plans for comment. In addition to making provisions for transit, RTC makes sure that developments do not close off access to streets, that opportunities for alternative mode linkages are exploited, and that walkways are appropriately located and provide ample capacity and separation from the roadway. The RTC will work through the Southern Nevada Regional Planning Coalition to formalize the comment process so that the agency may support alternative mode accommodation.

### **3.5.2 Specific Initiatives Underway to Encourage Walking and Biking and to Improve Accommodation, Access and Safety for Alternative Mode Travel**

Residential Access Review and Analysis – The RTC is working with local jurisdictions and homeowners associations to retrofit block walls with openings for use by pedestrians and bicyclists. Many subdivision designs practically mandate the use of a vehicle, since there are no linkages to adjacent destinations that could greatly reduce the length of the walking or biking trip. Openings also help to promote the use of transit since the walk distance to stops are shorter

End of Trip Facilities – Through the Alternative Mode Working Group the RTC is coordinating with local jurisdictions to define a best practices approach to installing end of trip facilities. These facilities are usually thought of as lockers, showers and a secure, well lit and safe location for bicycle storage. Additionally, the RTC Club Ride Program, part of the demand management initiative, is working with businesses to encourage provision of end of trip facilities

Early Consultation for Transportation Demand Management – Although voluntary, the RTC is working with the local entities to facilitate the planning of TDM infrastructure within master planned developments, business parks and activity centers. The idea is to involve the site developers early and demonstrate the benefits of accommodating alternative mode travel and other demand management strategies, such as park and rides and park and pool sites. The RTC will work with the Southern Nevada Planning Coalition to explore ways to make the process more formalized and possibly written into various development codes.

Street Retrofits – In the next year the RTC will work to develop a Street Retro-fit Demonstration Project. The RTC will nominate an incompatible street segment and improve the facility to a more complete street. As discussed under Existing Conditions, many of the area's sidewalks and street geometries are not compatible with comfortable walking and biking trips. The RTC's initiative would help to illustrate the value of retrofits as they will improve accommodation for Safe Routes to School and encourage walking and biking.

Development of a Pedestrian Action Safety Program – As discussed previously in this document, during the 2008-09 timeframe the RTC will develop a Pedestrian Action

Safety Program based on the FHWA template which incorporates best practices and processes based on years of research and field observation. The upshot of the project will be the ability to quickly respond to high crash locations by defining various strategies and countermeasures to reduce or eliminate the source of the conflicts. The process requires two key prerequisites: an inventory of roadway features and attributes and a way to view the latest data on crashes. The RTC will rely on the digital imaging product and will have completed the inventory for all facilities before the summer of 2008. Viewing crash data is discussed below.

Crash Safety Data Base – The RTC has contracted to develop a menu driven, crash data base that will allow users to query the crash data base by almost any variable. The product will be state of the art and will allow use with minimal training. The RTC will share this product with all of the related public agencies. This will enhance the crash review and countermeasure selection process, since area decisions will be rooted from a common, accessible data base available to all.

3-Unit Bike Racks - Starting in 2007, the RTC began to replace the 2-unit bike racks on all of the fixed route transit vehicles with 3-unit bike racks. The 50 percent increase in capacity will be a substantial improvement and will greatly reduce cyclists left behind due to no rack room.

RTC's Website - The RTC has made substantial modifications to the web site, particularly in the area of walking and biking. Most notable, the agency has located the complete digital imaging file on the web. The system requires no training to use. Go to [www.RTCSNV.com](http://www.RTCSNV.com); click on heading - Planning and open the pull down menu. From this point click on "Launch Virtual Tour" and an index aerial map with colored lines appears. Click on any colored line and the street image will open. The user only has to tap the enter key to move 'virtually' down any of the imaged roadways. Additionally, the web site includes the current public distribution 2007 – 2008 Bicycle Map for the Las Vegas Valley. Users can also view recommendations of safe bicycle travel under the Safety heading listed under "Planning". The system-wide adopted bicycle map is located under Documents – 2006-2030 BPE.

### **3.6 Public Involvement**

The BPE is an element of the RTP and will be reviewed and adopted with it according to the RTC's adopted Public Participation Plan.

## Response to Comments: Bicycle and Pedestrian Plan

Commenter	
Comment	Response
<b>Editorial Corrections</b>	
Pedestrian facilities lengths and exhibit.	Placed.
Sidewalk facility exhibit	Placed.
<b>Eric Glick, Nevada Department of Transportation</b>	
I could not find any reference regarding what design standards will be used in the construction and maintenance of bicycle and pedestrian facilities. Somewhere it should state you will use "AASHTO Guide for the Development of Bicycle Facilities", "AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities" or even your blue book "Standard Specifications" as an overall design standard.	"Consistency among entity design requirements is assured through regional adoption of AASHTO Bicycle and Pedestrian Facilities Guidelines into the Clark County Area Uniform Standard Drawings." added Section 1.6.2 in the Continuity/Connectivity of Systems discussion and to the first paragraph of Section 3.5.
Also, I did not see any reference regarding future planned facilities such as a map or table showing the types of facilities planned, the location and limits. If this is located in a separate document, the document needs to be referenced and a copy provided.	The reference to bicycle facilities that are included in the Regional Transportation Plan and its location at <a href="http://www.rtcsnv.com">www.rtcsnv.com</a> is made at the bottom of page 19. The fact that there is no formal plan for sidewalk improvements is noted in the first paragraph of section 3.1.4 Pedestrian Facilities
Page 23 The mileage is missing from the class of sidewalks in the small table.	Mileage added.
Pages 25-29 Tables 3-3, 3-4, 3-5, 3-6 and 3-7 use the word "Programmed" should it be "Planned" or do you really have the money programmed for those facilities in those communities?	Funding is programmed for these facilities by the local community, by regional alternate mode facility funding sources such as Southern Nevada Public Lands Management Act or Question 10, or as part of roadway maintenance projects.
The references to tables 3-4, 3-5, 3-6 and 3-7 in the text is shown as tables 2-4, 2-5, 2-6 and 2-7.	Corrected.
Page 30 Third paragraph - "NDOT offers a survey on its website..." What survey and what is the address to the website?	Web address inserted.
Page 34 #2 References CCITT. What is CCITT?	"Central City Intermodal Transit Terminal" added to the text.